

REMARKS

This paper is responsive to an Official Action that issued in this case on April 10, 2006.

In applicant's previous Amendment, claims 1-33 were canceled and new claims 34 -62 were presented for examination. In the most recent Action by the Office, the Examiner agreed that new claims 34 - 62 distinguish the references that were previously cited. New rejections, however, were issued based on two newly-cited references. More particularly, the Office rejected the claims as follows:

- Claims 34, 35, 39, 44, 45, 53, 55, 56, and 61 were rejected under 35 USC §102 as being anticipated by U.S. Pat. No. 6,165,633 to Negishi.
- Claims 34, 35, 38, 40, 53-56, 61, and 62 were rejected under 35 USC §102 as being anticipated by U.S. Pat. No. 6,696,185 to Okamoto.
- Claims 36, 37, 47-50, and 52 were rejected under 35 USC §102 as being anticipated, or, in the alternative, under 35 USC §103 as being obvious over Negishi.
- Claims 38, 40-43, 51, 54, 57-60, and 62 were rejected under 35 USC §103 as being obvious over Negishi.
- Claims 39, 41-45, 52, and 57-60 were rejected under 35 USC §103 as being obvious over Okamoto.
- Claim 59 was rejected under 35 USC §112, ¶2 as being indefinite.

Responsive to the Action, claims 34, 47, and 53 have been amended. Reconsideration is respectfully requested in view of the foregoing amendments and the following comments.

Claims 34-46

Amended independent claim 34 recites a system comprising:

a memory metal; and
a catalyst, wherein said catalyst is disposed as a coating on a first surface of said memory metal.

(Emphasis added.)

Claim 34 has been amended to recite that the catalyst is disposed as a coating on said memory metal. Support for this amendment is contained in the specification at, for example, paras. [0018], [0019], and [0020].

The amendment to claim 34 is to distinguish situations in which a catalyst might abut or be adjacent to a memory metal, such as might occur in the fuel-reforming system that is disclosed by Negishi. In particular, Negishi discloses regulating apertures (83) that control a supply of air to reformer 22b. (See, col. 26, lines 8-18; Fig. 8.) Negishi discloses that the regulating apertures can be a shape-memory alloy. In Fig. 8, the regulating apertures appear to be disposed within an interface (cylindrical wall?) that contains catalyst. If that were the case, then there might be contact between some of the catalyst and the memory metal serving as the regulating apertures.

Fig. 8 depicts the reformer at a rather high level of abstraction and does not provide any true mechanical detail about the specific location of the regulating apertures vis-à-vis the catalyst. In a typical design, it would be expected that the regulating apertures do NOT contact the catalyst.

But rather than engage in a dialogue with the Office about what exactly Negishi discloses or doesn't disclose, applicant has chosen to amend the claims to clearly distinguish the case wherein a catalyst might inadvertently abut the memory metal.

Negishi does not disclose or suggest that catalyst should be disposed as a coating on a surface of a memory metal. Claim 34 is, therefore, allowable over Negishi.

The Office also rejected claim 34 over Okamoto. Unlike Negishi, wherein the issue of inadvertent contact between the memory metal and catalyst is not clear, it is clear that in Okamoto, there is NO contact between the memory metal and the catalyst.

As seen perhaps most clearly in FIG. 4 of Okamoto, the filler (83), which in one embodiment is a shape-memory alloy (83b), is disposed inside of chamber (25). (See, col. 7, lines 37-42.) The first separator (16) fits in the hole (24) to the left of chamber (25). (See, col. 7, lines 45-46.) The power-generating section (12), which includes the catalyst layers (62a) and (62b), is disposed on the left of first separator (16). (See, col. 7, lines 4-16; FIG.4, right-most illustration.) Thus, the catalyst layers are on the left of the first separator (16) and the shape-memory alloy is on the right of the first separator (16).

In operation, the filler (83) is expanded or contracted, therefore displacing first separator (16) towards or away from the catalyst layer (62b). (See, e.g., col. 2, lines 32-45.) When the filler (83) is a shape-memory alloy, heat is used to control the expansion or contraction. (See col. 14, line 38 – col. 15, line 34.)

Whether in the expanded or contracted state, filler (83) does NOT contact the catalyst layers (62a, 62b). Okamoto, therefore, does not disclose or suggest that catalyst should be disposed as a coating on the surface of a memory metal. Claim 34 is, therefore, allowable over Okamoto.

Since neither Negishi nor Okamoto disclose that catalyst should be disposed as a coating on the surface of a shape-memory alloy, claim 34 is allowable over those references. Claims 35-46 are allowable based on their dependence on claim 34. Furthermore, these dependent claims recite other patentable features that provide a secondary basis for patentability.

Claims 47-52

Amended independent claim 47 recites a system comprising:

a memory metal; and
a fuel-oxidizer mixture, wherein said fuel-oxidizer mixture is disposed as a *coating* on a first surface of said memory metal.

(Emphasis added.)

Claim 47 has been amended to recite that the fuel-oxidizer mixture is disposed as a *coating* on said memory metal. Support for this amendment is contained in originally-filed claims 10, 23, and 26, which recite that the fuel-oxidizer mixture is applied to a surface of the memory metal. The term "a coating" replaces "is applied" to improve the form of the claim (i.e., "is applied" is more appropriate in a method claim).

Neither Negishi nor Okamoto disclose or suggest applying a fuel-oxidizer mixture to a memory metal as a coating. Note that flowing the fuel-oxidizer mixture over the memory metal, as described in some embodiments of applicant's invention and as discussed in the prior art, is different than applying the fuel-oxidizer mixture as a coating. Clearly, not all fuel-oxidizer mixtures disclosed by the applicant or otherwise known to those skilled in the art can be applied as a coating.

Since neither Negishi nor Okamoto disclose or suggest that the fuel-oxidizer mixture should be disposed as a coating on the surface of a shape-memory alloy, claim 47 is allowable over those references. Claims 48-52 are likewise allowable based on their dependence on claim 47. Furthermore, these dependent claims recite other patentable features that provide a secondary basis for patentability.

Claims 53-62

Amended independent claim 53 recites a method comprising:

providing a memory metal having a catalyst disposed as a coating thereon; and
exposing said memory metal and said catalyst to a fuel-oxidizer mixture.

(Emphasis added.)

Claim 53 has been amended to recite that the catalyst is disposed as a coating on said memory metal. Support for this amendment is contained in the specification at, for example, paras. [0018], [0019], and [0020].

As previously discussed, neither Negishi or Okamoto disclose that catalyst should be disposed as a coating on the surface of a shape-memory alloy. Consequently, claim 53 is allowable over those references. Claims 54-62 are allowable based on their dependence on claim 53. Furthermore, these dependent claims recite other patentable features that provide a secondary basis for patentability.

Claim 59

The Office rejected claim 59 under 35 USC §112, ¶2 as being indefinite for reciting the phrase "loss of heat." The Office notes that "heat cannot be created or destroyed but can only be changed into a different form of energy" and alleges that the meaning of this phrase in the claim is uncertain. Clarification was requested.

Claim 59 recites:

The method of claim 58 further comprising controlling said amount of fuel-oxidizer mixture so that a sum of heat applied and heat generated during said reaction balances loss of heat.

The statement that "heat cannot be created or destroyed" is true of course. The term "loss of heat," refers, as it always does, to loss from the system or to the ambient environment. Anyone skilled in the art would understand this. If the Examiner feels that it is necessary to add such a limitation to the claim, the applicant will do so. It is expected, however, that in view of the explanation provided, such an amendment will not be necessary.

Further background concerning the embodiments to which this claim pertains can be found in the specification at paragraphs [0021] through [0023] and in the drawings at Figure 4.

Conclusion

Claims 34 through 62 now presented for examination are believed to be in condition for allowance. The applicants therefore request that the Examiner allow all of the pending claims and pass the application to issue.

Should there remain unresolved issues the applicant respectfully requests that Examiner telephone the applicants' attorney at 732-578-0103 x12 so that those issues can be resolved as quickly as possible.

Respectfully,

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